

**Design technology**  
**Higher level**  
**Paper 3**

Tuesday 15 November 2016 (morning)

Candidate session number

1 hour 30 minutes

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**Instructions to candidates**

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all of the questions.
- Write your answers in the boxes provided.
- A calculator is required for this paper.
- The maximum mark for this examination paper is **[40 marks]**.



## Section A

Answer **all** questions.

1. Every product in Nokia's mobile phone portfolio is analysed during the design process using sustainable design principles to reduce its environmental impact. **Figure 1** shows an example of a Nokia product which includes a hole the user will insert their finger into to spin the phone, like they would do with a keychain, for a period of time to recharge the phone.

The device was designed to use recycled materials and is shipped in a package that can be used to send the mobile phone back to Nokia for recycling. This allows Nokia to comply with take-back legislation. Nokia has been reporting its performance on sustainability issues every year since 2007.

**Figure 1: Nokia “Green Core” mobile phone**

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Please go to: [http://itechfuture.com/  
concept-cell-phones-nokia-ec509/](http://itechfuture.com/concept-cell-phones-nokia-ec509/)

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(Question 1 continued)

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(a) List **two** ways that Nokia's designs may be considered sustainable.

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(b) Outline **one** reason why Nokia would use sustainability reporting.

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12EP03

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(Question 1 continued)

- (c) Explain **two** implications of take-back legislation for designers of the Nokia “Green Core” phone.

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2. In 1993, James Dyson launched the production of the first range of vacuum cleaners based on a new technology known as dual cyclone technology. **Figure 2** shows an upright vacuum cleaner. Upon the success of this product, the Dyson company continued developing new vacuum cleaners, such as cylinders, cordless, and hand-held in order to maintain its market-leading position.

At the Dyson company, product development is not the only growth strategy. It has adopted a diversification strategy by moving into the fan, heater, and hand dryer markets. The Dyson company has also invested heavily in creating a brand identity for all of its products that is based on them being of a higher quality than those of the competitors.

**Figure 2: The Dyson upright vacuum cleaner**



[Source: adapted from [www.dyson.co.uk](http://www.dyson.co.uk)]

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**(Question 2 continued)**

- (a) List **two** benefits of the Dyson company creating a distinctive brand identity. [2]

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- (b) Outline why the Dyson company would use market segmentation as part of its product development strategy. [2]

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- (c) Outline why the production of Dyson's vacuum cleaner family leads to improved cost effectiveness for the Dyson company. [2]

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**(Question 2 continued)**

- (d) Explain why the Dyson company would use both product development **and** product diversification as growth strategies.

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**End of Section A**



12EP07

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## Section B

3. Read the case study. Answer the following question.

Adidas was formed as a company in the 1920s by Rudolf and Adi Dassler. The aim of the company was to consider the needs of athletes when developing new products.

Adidas used user-centred design (UCD) principles and techniques when developing the Brazuca football which was used in the 2014 World Cup in Brazil. Also, Adidas used rigorous quality management in order to meet the football quality requirements.

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**(Question 3 continued)**

- (a) List **two** elements of the user-centred design (UCD) process.

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**(Question 3 continued)**

- (b) Outline **one** reason why only relying on a usability lab, as shown in **Figure 3**, may lead to the Adidas football not functioning as intended.

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- (c) Outline **one** advantage of the data obtained from a focus group when using user-centred design approaches in the early stages of development of a new Adidas football.

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**(Question 3 continued)**

- (d) Discuss the extent to which design for emotion impacts on the design **and** marketing of the Adidas Brazuca football.

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(e) Discuss the implications of quality management for Adidas in terms of quality control, statistical process control, **and** quality assurance in the production of the Brazuca football, as shown in **Figure 4**.

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